

REMARKS

The Examiner contends that the amendment filed on September 30, 2003, in the present RCE application is not fully responsive to the prior official action. The prior official action in this case was dated May 7, 2003, and in that official action claims 6 and 16, the only claims then pending, were rejected solely on the basis of 35 U.S.C. § 112, first paragraph.

The Examiner contends that applicant has failed to present arguments pointing out distinctions between newly presented claim 17 and the references applied by the Examiner in an earlier official action dated May 23, 2002, in the parent application, relying on Tsumara and Schwabegger, and applied against claims which are no longer being prosecuted.

Applicant initially submits that the Examiner's position is simply incorrect. Firstly, Rule 111(b) states that to be entitled to reconsideration or further examination the applicant must reply to the office action. The rule goes on to state that the reply must point out the supposed errors in the Examiner's action and reply to every ground of objection and rejection "in the prior office action." The rule also states that the reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. It is therefore clear beyond question that this entire rule applies to the "prior office action." It does not and cannot apply to all prior office actions that may have been filed in the present application and its parent applications. It is therefore clear that applicant's response of September 30, 2003, is entirely adequate and in full compliance with the rules, including Rule 111(b). Secondly, the fact that the Examiner has previously removed the rejection of claims 6 and 16 over these very same references suggests that the Examiner has accepted the

fact that claims of this scope are fully patentable over the combination of Tsumura and Schwabegger. This same reasoning would appear to apply to new claim 17, which in at least one respect, in requiring that the oxidation-reduction potential be maintained at greater than 200 mV, is narrower than these claims.

Nevertheless, and in order to expedite the prosecution of this application, applicant will now demonstrate that newly added claim 17 is clearly patentable over the references applied in the May 23, 2002, official action.

Claims 5 and 6 were previously rejected as being unpatentable over Tsumura *et al.* and Schwabegger *et al.* under 35 U.S.C. § 103(a). The Examiner had contended that Tsumura *et al.* substantially described the claimed biological waste water treatment of the present invention, but admitted that it did not teach electrolysis of the waste water. Tsumura *et al.* was said to be directed to the problem of removing phosphorous from waste water. Schwabegger *et al.* was then cited as also being directed to removal of phosphorous from biologically treated waste water, and as allegedly suggesting removing phosphorous by subjecting the waste water to electrolysis treatment. The Examiner thus concluded that it would have been obvious to have done so in Tsumura *et al.* to further the aims and objectives of that reference. This rejection, as potentially applied to claim 17, is respectfully traversed for the reasons set forth hereinafter.

In the background section of the present application, applicant sets forth a detailed analysis of the state of the art in connection with the biological treatment of organic waste materials. While various schemes for carrying out such biological treatment are well known, it is an object of this invention to improve upon these various sludge reduction processes by significantly reducing the overall amounts of the

sludge material produced in these processes. In accordance with the present invention, and in particular the preferred embodiment of claim 17 hereof, sludge produced during biological treatment processes can now be significantly reduced by initially subjecting the sludge to biological digestion to convert at least a portion of the organic waste to a clear decant and a mixture of bio-solids and unconverted organic material, a portion of this material is then subjected to an oxidizing agent generated by electrolysis, or by electrolysis itself, the oxidation reduction potential of the mixture of bio-solids and unconverted organic material is then monitored, and the concentration of the oxidizing agent produced by electrolysis, or by electrolysis itself, is then adjusted in order to maintain the oxidation-reduction potential of that mixture to a value greater than 200 mV to produce a conditioned effluent, which is then returned to the initial biological reactor.

Applicant has discovered that by using such a process it is now possible to significantly reduce the amount of sludge produced in such biological treatment processes, at least to an extent far greater than that which has previously been possible.

Turning to the cited references, it is initially noted that neither reference is directed to this goal. While these references thus do relate to biological treatments of various kinds, they are not directed to processes for somehow reducing the sludge produced in these biological treatment processes, and certainly not in the precise manner which applicant utilizes. Indeed, the references assert that they are only concerned with reducing the nitrogen and phosphorous produced in such processes.

Turning first to Tsumura et al., after recognizing the conventional nature of various sewage treatment processes directed to removing organic matter, these patentees

specifically direct their attention to the elimination of nitrogen and phosphorous which may cause eutrophication. Therefore, in connection with the apparatus shown in FIGS. 1 and 11 thereof, these patentees have conceived of a system which includes a first aeration tank, a second aeration tank, a final settling tank, and a specific control mechanism therefor. Turning to FIG. 11, it can thus be seen that the control system disclosed in Tsumura et al. includes a dissolved oxygen (DO) meter 10a to measure dissolved oxygen concentration in the first aeration tank 2a, an oxidation-reduction potential (ORP) meter 6b for measuring an oxidation-reduction potential of the second aeration tank 2b, as well as a control panel 9 to generate control signals to an inverter 11a to control the DO concentration of the first aeration tank 2a. Thus, the basic process disclosed in Tsumura et al. for increasing the removal of nitrogen and phosphorous requires performing aeration for a predetermined time period in the first aeration tank, and then stopping aeration and initiating the agitation thereof. Then, in the second aeration tank the sum of the aeration period and the agitation period is controlled to a second time period which is longer than the first time period, based on a specific point on the ORP curve detected by the ORP meter, at which point both the first and second aeration tanks are transferred from agitation to aeration. Thus, the teachings in this patent are clearly limited to a specific method of operating a specific system, in which an ORP meter is used in an effort to maximize the removal of nitrogen and phosphorous therein. There is nothing whatsoever taught by Tsumura et al. with respect to contacting a portion of a mixture of bio-solids and organic material from a biological reactor with an oxidizing agent produced by electrolysis in a chemical treatment unit; then using an ORP meter to monitor the oxidation reduction potential in such a unit; adjusting the concentration of the oxidizing

agent produced by such electrolysis in order to maintain the oxidation reduction potential at any specified level, and certainly not the 200 mV of claim 17; and then returning the conditioned effluent produced therein to the biological reactor. The mere fact that the Tsumura *et al.* patent uses an ORP meter for a particular reason, which does not relate to applicant's claimed invention, does not in any way obviate this invention. Applicant has never claimed to have invented ORP meters, but it is the precise way that such equipment is used in connection with the processes of claim 17 which constitutes applicant's inventive contribution. Use of an ORP meter in a specific claimed process in which a biological reactor is followed by the chemical treatment unit specified in these claims, namely one in which a portion of the bio-solids and unconverted organic material is contacted with an oxidizing agent comprising electrolysis, clearly distinguishes this invention from anything suggested by Tsumura *et al.*

Any attempt to overcome these deficiencies in Tsumura *et al.* by combining this reference with Schwabegger *et al.* cannot successfully overcome these deficiencies in the primary reference. Schwabegger *et al.* is solely directed to reduction of the phosphorous content of waste water. In particular, these patentees claim to have reduced such phosphorous content by subjecting the waste water to electrolysis, leading to phosphorous precipitation so that a phosphorous-enriched sludge is produced. It is thus unclear precisely how this invention could even be incorporated into the Tsumura *et al.* process. However, even if this were done, it would not result in the presently claimed process. Firstly, Schwabegger *et al.* merely contact waste water with metal electrodes so that phosphate ions are precipitated at the cathode. Like Tsumura *et al.*, this process has nothing to do with the principal object of the present invention; namely, using electrolysis in a specified

process in order to increase the biodegradable nature of a biomass.

As for the impropriety of this particular combination of references, since the Tsumura *et al.* patent discloses a technique for increasing the removal of phosphorous, there would certainly be no reason to use Schwabegger *et al.* in combination with Tsumura *et al.* Indeed, the only logical way to utilize the teachings of Schwabegger *et al.* would be to merely substitute its process for the entire process of Tsumura *et al.* There is no simple way that the Schwabegger *et al.* invention could be incorporated into Tsumura *et al.* Even if this were attempted, however, one would not then somehow arrive at the presently claimed process. There is no suggestion in these cited references to carry out biological digestion in a biological reactor to convert a portion of the organic waste to a clear decant and a mixture of bio-solids and unconverted organic material, and to then contact at least a portion of this mixture with at least one oxidizing agent produced by electrolysis, while monitoring the ORP of the mixture in the chemical treatment unit, so that the concentration of the oxidizing agent contacted with the mixture can be adjusted to maintain the ORP at a predetermined level of greater than 200 mV in order to provide a conditioned effluent which is then returned to the biological reactor. This process is simply not suggested by either of these references, either alone or in combination.

It is therefore respectfully submitted that claim 17, as is the case with claims 6 and 16, clearly possesses the requisite novelty, utility and unobviousness to warrant their immediate allowance, and such action is therefor respectfully solicited. If, however, for any reason the Examiner still does not believe that such action can be taken at this time, it is respectfully requested that he telephone applicant's attorney at

(908) 654-5000 in order to overcome any further alleged deficiencies in this application.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he/she telephone applicant's attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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